

SUDAN—death of an iconic rhino

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Sudan, the last known male Northern White Rhino (NWR) (*C. simum cottoni*) died of age-related complications on 19 March aged 45, at Ol Pejeta Conservancy in Kenya, where he has been living for the last seven years. Probably the most famous rhino in the world, with a vast Facebook following, and appearances in numerous films and documentaries world-wide, including the BBC film with his name, “Sudan, The Last Rhinos”. *Sudan* and the last known female NWRs *Najin* and her daughter *Fatu* have been symbolic of the fight to save a major charismatic sub-species from extinction in our lifetimes. Their (NWR) compatriots in the wild have shown some of the greatest successes and rapid rates of increase, proving how important it is to conserve them in their natural habitats. But they also symbolise some of the toughest challenges that conservation is up against, living in unique but remote ecosystems with other rare and valuable sub-species, they have been beset by exploitation to fund wars and caught up in armed conflict, power politics and corruption. All this—to feed the illegal wildlife trade, with maximum benefit to the middlemen, not to the poachers and rangers who risk their lives, or even to the end users and certainly not to the rhinos themselves. As a conservation biologist based in Garamba National Park for 25 years, it was a privilege to see the wild population thrive with rapid birth of calves and even the successes of conservation in times of war. But we also saw the overwhelming tipping of the scales, for the wrong reasons, until they are now very close to extinction in the wild and certainly in areas of difficult access.

The loss of *Sudan* brings home the realisation that the NWR is in peril, and there is only a slim chance to save the sub-species through artificial reproductive techniques (ARTs), or pioneering surrogacy, which has never been done before with rhinos.

Sudan was born in 1973 in South Sudan,

in an area that later became Shambe Game Reserve in the Upper Nile province. Here the swamps of the Sudd with a habitat of six-foot high grass, scattered scrub and seasonal floods was ideal habitat for NWR and other species. In 1975 the capture team of Josef Wagner, Director and creator of the Dvůr Králové Zoo in Czechia in what is now the Czech Republic caught *Sudan* with nine other young rhinos, aged 2-5 years. One male died in March that year, while three were sent to the Game Department zoo in Juba. The remaining six were then transported by lorry and freight from Sudan, through Uganda to Mombasa Port and from East Africa to northern Europe: including *Sudan*, another male rhino, *Saut* and four females. (See: http://www.rhinosourcecenter.com/pdf_files/149/1491548819.pdf).

In the 1960s and ‘70s eight expeditions organised by Wagner had captured many African animals of a range of species. Although such captures are anathema these days, the zoo thus became an important breeding reservoir of wildlife that was often declining in its natural habitat and from which many species have been re-introduced to the wild. The young *Sudan* became habituated to humans quicker than most and was a favourite in the capture camp.

The rhinos learned to adapt to the different climate of seasonal snows and the regimes of care of well-catered zoos. Breeding in zoos is challenging if facilities do not allow sufficient habitat for the males to become territorial and the females to move between them when in oestrus and often the animals grow up more like siblings. However a newcomer may stimulate breeding and when *Nasima* who had been caught in Uganda came to Dvůr Králové Zoo, she was mated first by *Saut* and in 1980 gave birth to a male *Suni*, then in 1983 *Sudan* and *Nasima* had a daughter *Nabire* and in 1989 *Nasima* became a mother again, this time to the female *Najin*. However the NWR zoo breeding programme had little success compared with the wild.

With an estimate of only 780 individuals in south Sudan, they were already considered “endangered” by Wagner in 1975. In the early 20th century however,

the NWR ranged from Southern Chad, through CAR, southern Sudan and northern Congo/Zaire to the West Nile in Uganda, with an estimated population of around 5,000 (Roger Wheeler pers. comms). By the early 1980s they appeared limited to Southern National Park and Shambe in Sudan, a few were translocated from West Nile to Murchison Falls NP in Uganda and the best hope was the population in Garamba National Park (GNP) in what was then Zaire. Even the GNP population had been decimated from over 1,000 in 1960 to about 200 during the post Independence Simba Rebellion. The population increased with protection to over 490 by 1976, but then plummeted with the widespread poaching of the late 1970s and early 1980s amplified by the civil war across the border in southern Sudan. When the Garamba Project began in 1984 only 15 NWR remained, elephants had also rapidly declined, from over 22,000 to about 5,000. But with the combination of ideal habitat and effective protection, numbers of both rhinos and elephants doubled in eight years and there were many new rhino calf sightings (Hillman Smith et al. 2014).

In the meantime the rhinos in captivity had been gradually decreasing and in 1995 a meeting brought together stakeholders of both zoo and wild NWR to discuss saving the species through managing them as a meta-population, establishing a secure back up breeding population of rhinos with individuals from both the wild and those in captivity. Options were assessed and both Ol Pejeta Conservancy in Kenya and the White Oak Conservation Centre in Florida offered the best combination of habitat, climate and security, but no decision could be agreed upon.

Positive follow up from the meeting led to developing hormonal monitoring and reproductive stimulation at both San Diego Wild Animal Park and Dvůr Králové Zoo and later to the transfer in 1998 of the un-related male *Saut* from San Diego back to Czechia. This led to several matings and in March 1999 *Najin* conceived. Her daughter who became the much-lauded “Baby of the Millenium” was born on 29th June 2000 and named *Fatu*. (Holečková and Bobek 2000).

In the wild, GNP, while successfully combating the increasing poaching from the war in Sudan,

was affected by yet another war, this time the Liberation War early in 1997. All rangers were disarmed and anti-poaching activities ceased for three months. Elephant numbers halved and the rhino population stopped increasing, though with five births during those few months numbers remained the same. The effect of the war that started in August 1998 in what was then the Democratic Republic of Congo was less dramatic but longer lasting. Conservation continued successfully with the help of the UN Foundation/UNESCO/ICCN programme for conservation of the five World Heritage Sites during Armed Conflict and rhino numbers were held stable. But with a cease-fire in South Sudan, in 2004 the *mbororo* horsemen from the north were able to get through the Sudan People’s Liberation Army held border area and into GNP starting a massacre of elephants and rhinos. The proposal to rescue a few NWR and hold them temporarily at Ol Pejeta caused a political storm and had to be shelved. Now they are feared to be extinct in the wild though there are still occasional reports and sighting from remote areas of Sudan which are being followed up under the auspices Dr Malik of the South Sudan wildlife department with support being raised by Philip Winter, and there have been reports from around Garamba through the community intelligence group “Invisible Children” (P Giningayo. pers comm.)

This left the main practical hope of saving the NWR from total extinction with the rhinos remaining in Dvůr Králové Zoo in Czechia, and new technical developments for assisted reproduction. Following intervention by the AfrSG in 2008 to optimise the breeding success, and with support from “Back to Africa” organisation *Sudan, Najin, Fatu* and another male *Suni* were moved to the Ol Pejeta Conservancy in 2009; and a more natural habitat, to give them a chance to develop natural social systems to stimulate breeding. Despite high tech back up from the development of assisted reproduction techniques by the Berlin Institute and the Reproductive Department of San Diego Wild Animal Park some matings were recorded but no conceptions. *Suni* died two years ago in 2016, leaving just three: *Sudan*, *Sudan*’s daughter and grand-daughter.

Ways to save the species now are limited, but modern technology has opened new options. These include safe oocyte extraction, in vitro fertilisation and implantation in surrogate mothers, heralding a new era of conservation and being pursued by Thomas Hildebrandt and others of the Berlin Institute and also the stem cell creation from other tissue being pursued

in San Diego Zoo. But it also emphasises the importance of being able to follow up the reports of rhinos in remote areas, despite intractable conservation challenges. Even the slimmest of chances are worthwhile at this stage. It is essential that we continue doing all that we can to preserve the species in a collaborative way. Meanwhile African Parks is conserving their habitat and the ecosystem and other species of Garamba National Park.

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